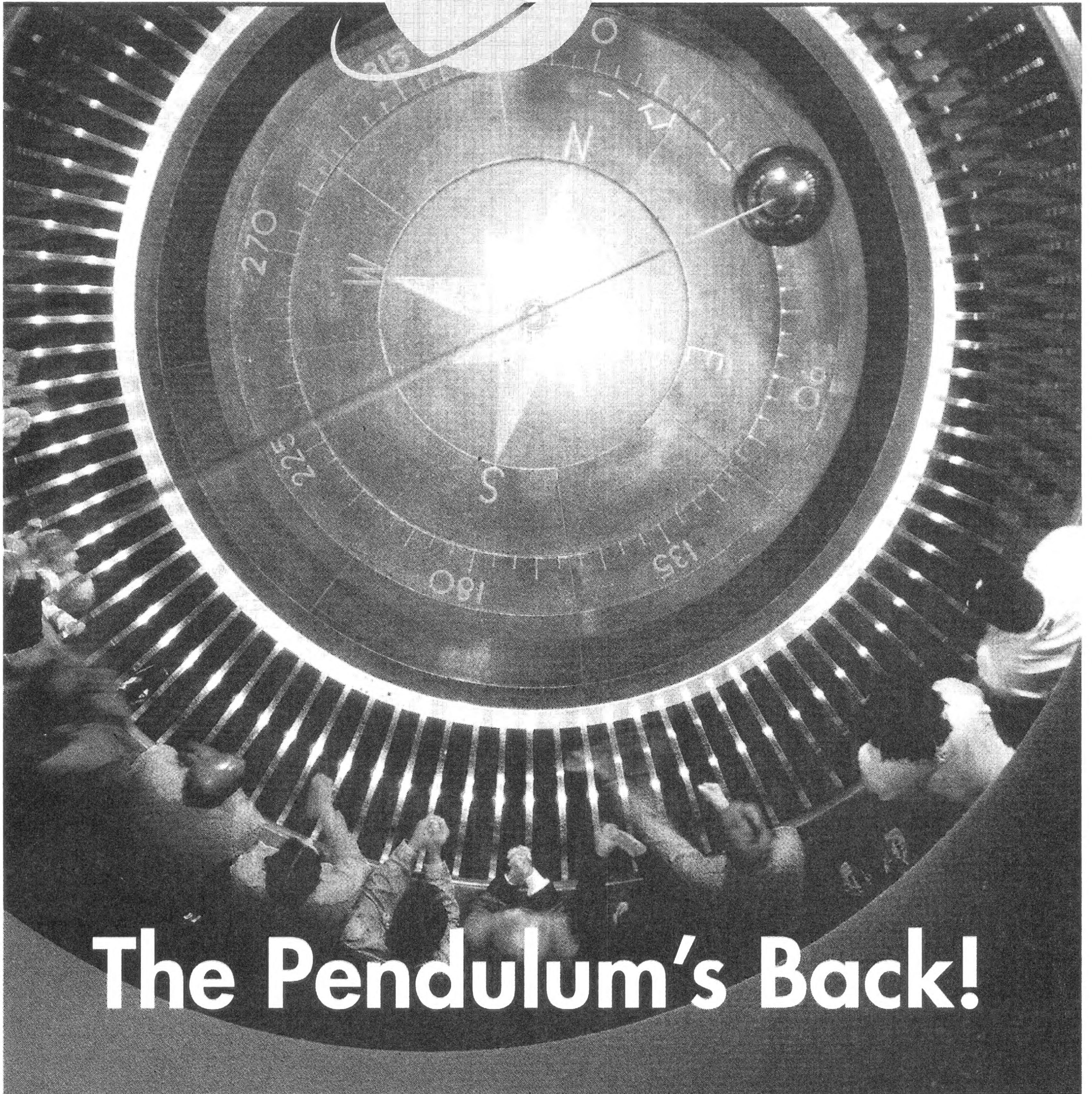


Academy

California Academy of Sciences' Member Newsletter

August & September 2002

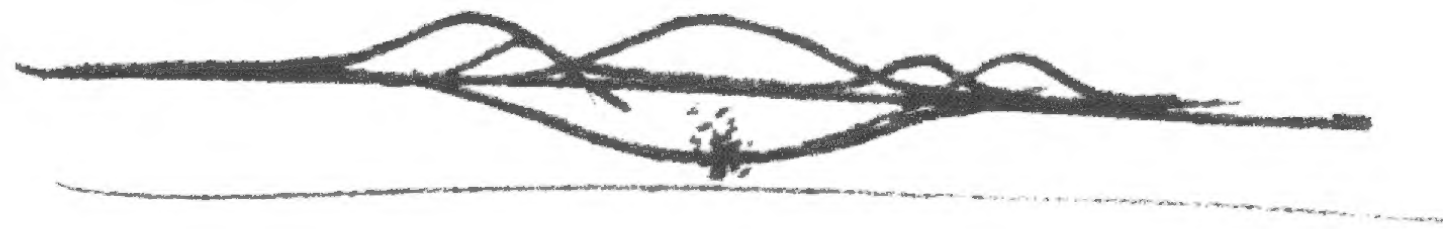
\$1



The Pendulum's Back!

Message to Members

Plans for the New Academy Unveiled



Last month, we took an exciting and important step forward when we unveiled our design for the new Academy in Golden Gate Park. Though planning for the Academy's future has been underway for some time, this announcement marked the beginning of the next major phase, one that is certain to engage and inspire visitors in profound new ways for years to come.

The design for the new Academy accomplishes many goals.

First, it reflects the Academy's distinguished history in Golden Gate Park. Inspired by a photo of the Academy in the 1950's, our architect, Renzo Piano has created a design that both honors the history of the Academy and demonstrates innovative and inspiring architecture that will enhance the experience of visitors.

The design also reflects the Academy's commitment to the environment through the use of "green" architecture. We will use energy-efficient, environmentally-sensitive building technologies that we hope will set a new standard for sustainable architecture

among civic buildings. From the use of natural ventilation to the re-use of gray-water, our building will reflect our mission to protect the natural world.

The design reflects the beauty of our surroundings in one of the nation's largest urban parks.

Piano is known for creating historically and environmentally sensitive buildings. The new Academy will have a "living" roof that is planted with a variety of native plants to make nature part of the building. The shape of the roof will echo the natural landscape around the Academy, undulating gently over the new Morrison Planetarium, Steinhart Aquarium, and exhibition spaces, which will read as "hills" in the roofline. More efficient use of our interior spaces will enable us to occupy a smaller footprint than our current facility.

With modernized research labs, updated collections storage,

and state-of-the-art classrooms, the design will enable us to further our commitment to the advancement and teaching of science. We will be better equipped to train the next generation of scientists and meet the growing demand for science education.

And while the design is still in the early stages, the models you see represent over a year of work with architects, engineers, Academy staff, planners, and the input of you—our members.

Construction on the project will likely begin in early 2004. And as with other museums like the de Young Museum and the Museum of Modern Art in New York, the scope of this

bold plan requires that we temporarily relocate the Academy's public exhibitions, staff, and collections. While moving will be a formidable task, closing the existing Academy will prove safer, more convenient for members and visitors—and substantially faster and more cost-efficient—than tackling the project piecemeal.

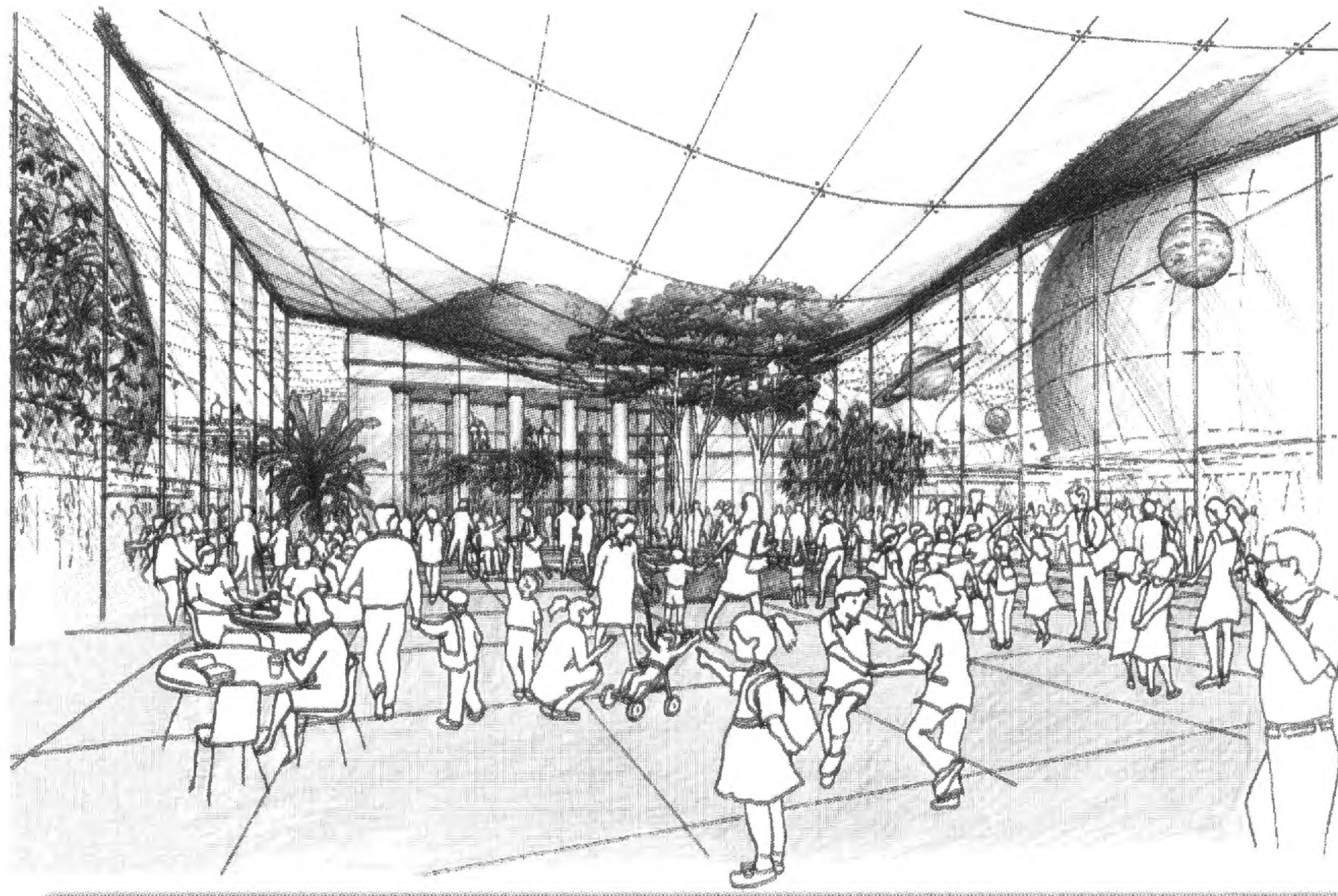
Between the closure of the current Academy and the

reopening of the new Academy, slated for early 2008, we will not disappear. Plans are well underway for a temporary facility that will house our public exhibits, though many details, including the facility's location, remain to be determined. However, we will remain in the city of San Francisco and we will continue to display many of the animals from the Steinhart Aquarium for our members and visitors.

During the transition and rebuilding of the Academy, the support of our members will be more important than ever. As the project progresses, we will come to you with more information about how you can get involved.

I hope you are as excited about the future of the Academy as I am.

Patrick Kociolek
Executive Director



(top) Renzo Piano's initial sketch of the new Academy roof. (above) The entrance to Steinhart Aquarium at the heart of the new Academy, as seen from the piazza.

Searching for Ancient Monuments of Early America

Dr. Sheldon Breiner

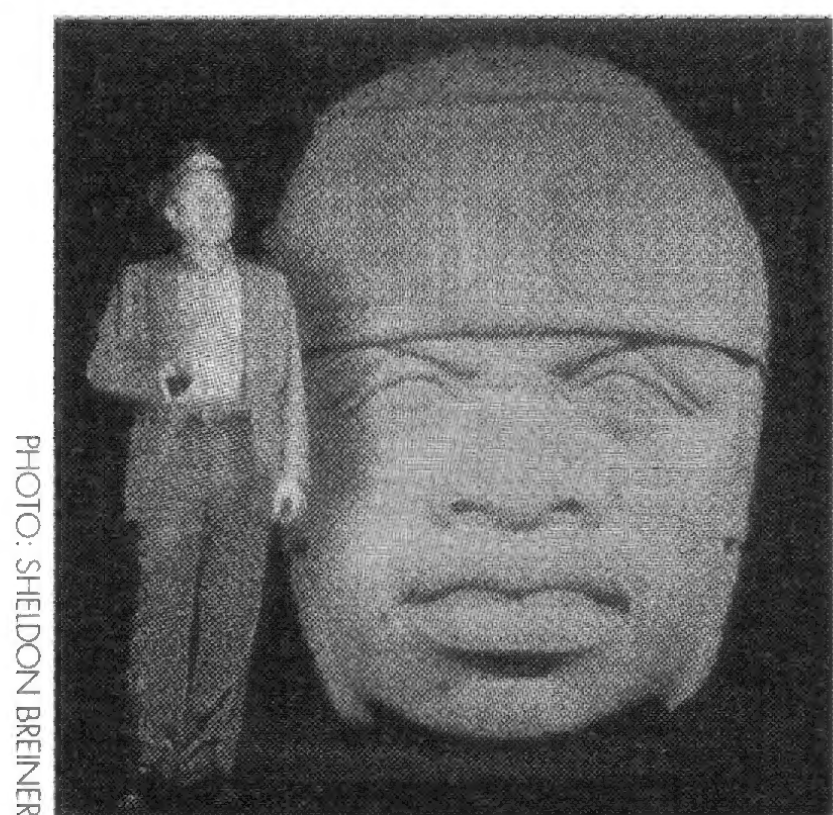


PHOTO: SHELDON BREINER

Dr. Sheldon Breiner with a giant Olmec head.

Dr. Sheldon Breiner has led a life of searching—searching for historic ships, undersea pipelines, aircraft flight recorders, weapons, tunnels, buried treasure, treasure ships, and tombs. Using a magnetometer, Dr. Breiner, a geophysicist from Stanford, has discovered a plethora of objects and archeological sites under the earth and sea. Among his most famous feats was the discovery of Sybaris, a 2,500-year-old famous Greek city completely buried 20 feet below the ground in Southern Italy.

In his latest adventure, Dr. Breiner used a horse and his treasured magnetometer, to discover 3,000-year-old colossal monuments in the lowland jungles of Southern Mexico at the San Lorenzo Tenochtitlan. View photos of these giant Olmec heads and other carved basalt objects which now reside in museums throughout Mexico. Learn about the people that gave rise to these astounding monuments and the search that yielded them to human eyes for a second time. *Wednesday, September 18 at 2 & 7:30 pm Morrison Auditorium; Free to Members/ \$8 non-members; Members note: this lecture takes place on the third Wednesday in September.* **F**

i **Members with membership cards will be admitted for free at the door; nonmembers may purchase tickets at the door. For more information, call (415) 750-7096**

Powers of Ten and Other Eames' Philosophies

Eames Demetrios

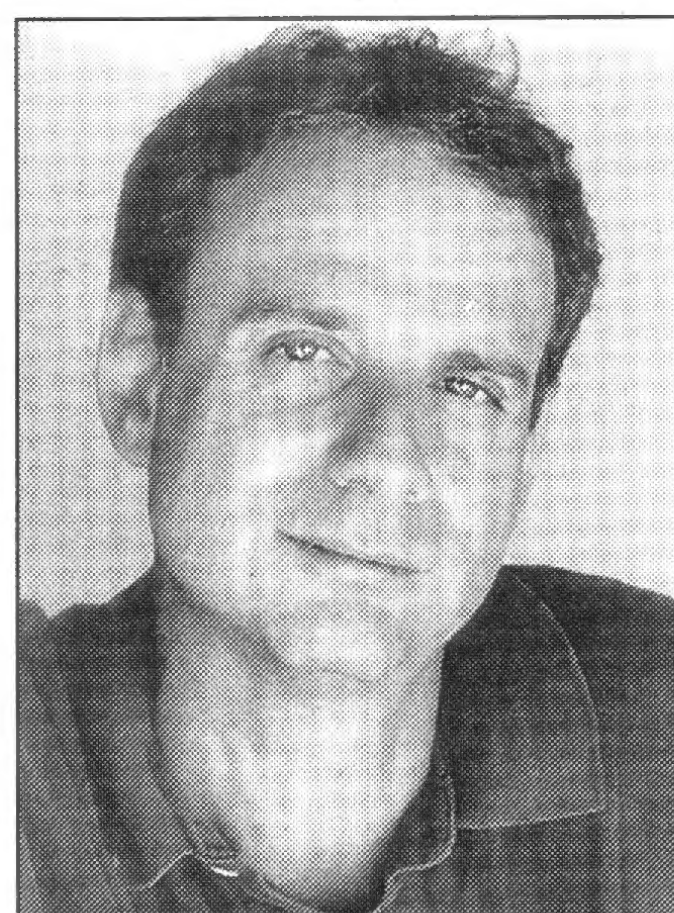
Eames Demetrios will speak about designing the **Powers of Ten** exhibit (see page 4) and his recently completed book, *An Eames Primer*, which provides the first documentation of the design process of his grandparents, Charles and Ray Eames, producers of the famous 1977 film "Powers of Ten." *Thursday, September 26 7:30 pm, Morrison Auditorium, \$6 members/\$8 non-members* **D**

Birds of East Africa

Dr. Richard Tenaza

Dr. Richard Tenaza takes us on a journey of the savannas, mountains and Rift Valley lakes of East Africa in search of the bird life that dwells in these diverse landscapes. Having led over 20 trips to the region, Dr. Tenaza presents an instructive and photographic exploration of over 200 species of birds, their behavior, their habitats, and the associated mammalian wildlife.

Dr. Richard Tenaza is an Academy Fellow and professor of biological sciences at the University of the Pacific in Stockton, CA. His research, teaching, and conservation work have taken him to the Arctic, Antarctica, Southeast Asia, Africa, and elsewhere. *Wednesday, August 14 at 2 & 7:30 pm; Morrison Auditorium; Free to Members/\$8 non-members* **F**



Beepers, buttons, and buzzers: What does the information age mean for you? Find out when James Gleick discusses his book, What Just Happened? August 22.

copyright, privacy, and patents.

Gleick describes the new cacophony of beepers, buzzers and rings that now infiltrate our consciousness on a daily basis. *WHAT JUST HAPPENED* — based on articles originally published in *The New York Times Magazine* and *The New Yorker* — is a time capsule: it is at once a fascinating portrait of what just transpired, and an illuminating look at what may still come in the future. *Thursday, August 22 7:30 pm, Morrison Auditorium, \$6 members/\$8 non-members* **D**

What Just Happened: A Chronicle from the Information Frontier

James Gleick

James Gleick looks at the implication of our new technological opportunities and asks whether our lives have been changed in truly vital or merely frivolous ways. He explores how our physical reach has been extended, by remote or by wireless; how the electronic version of familiar habits (whether advertising, retailing or publishing) raise new questions about old issues of

i **To purchase tickets, use the form on page 14 or call (415) 750-7128. Tickets will also be available at the door.**

Back in the Swing of Things

The Academy's Giant Pendulum is on the Move Again

By Stephanie Greenman

The largest timepiece at the Academy — a Foucault pendulum with a thirty foot cable and a 240 pound ball — ran like clockwork for over fifty years until the fire and smoke that swept through Hohfeld Hall this past August put it temporarily out of commission. The finish on its gleaming ball was tarnished, a few rubber parts melted, and the cable that supported its mesmerizing swing had to be cut to accommodate the necessary demolition work in the hall.

Now that the hall's restoration is complete, the pendulum has swung back into time. Once again, it rhythmically knocks down a full circle of pegs about every 36 hours. (You can calculate the exact amount of time by dividing 24 hours by the sine of San Francisco's latitude.) With each peg, it also proves a point that was once quite controversial: the Earth rotates. Although the pendulum appears to spin, gradually sweeping out a circular pattern of pegs, a principle called inertia causes it to maintain a constant course. The ground beneath it is what actually rotates.

"Imagine suspending a ten-pound bag of flour on a long string," explains Morrison Planetarium educator Kirsten Vanstone. "Set the bag swinging, and then try to change the direction of the swing by twisting the top of the string. It won't work — the bag's heavy mass (and thus its high inertia) will tend to keep it swinging in the same direction."

The pendulum works in more or less the same way. As the Earth spins, the swinging ball's great inertia keeps it from twisting along with the building that houses it. As the Academy

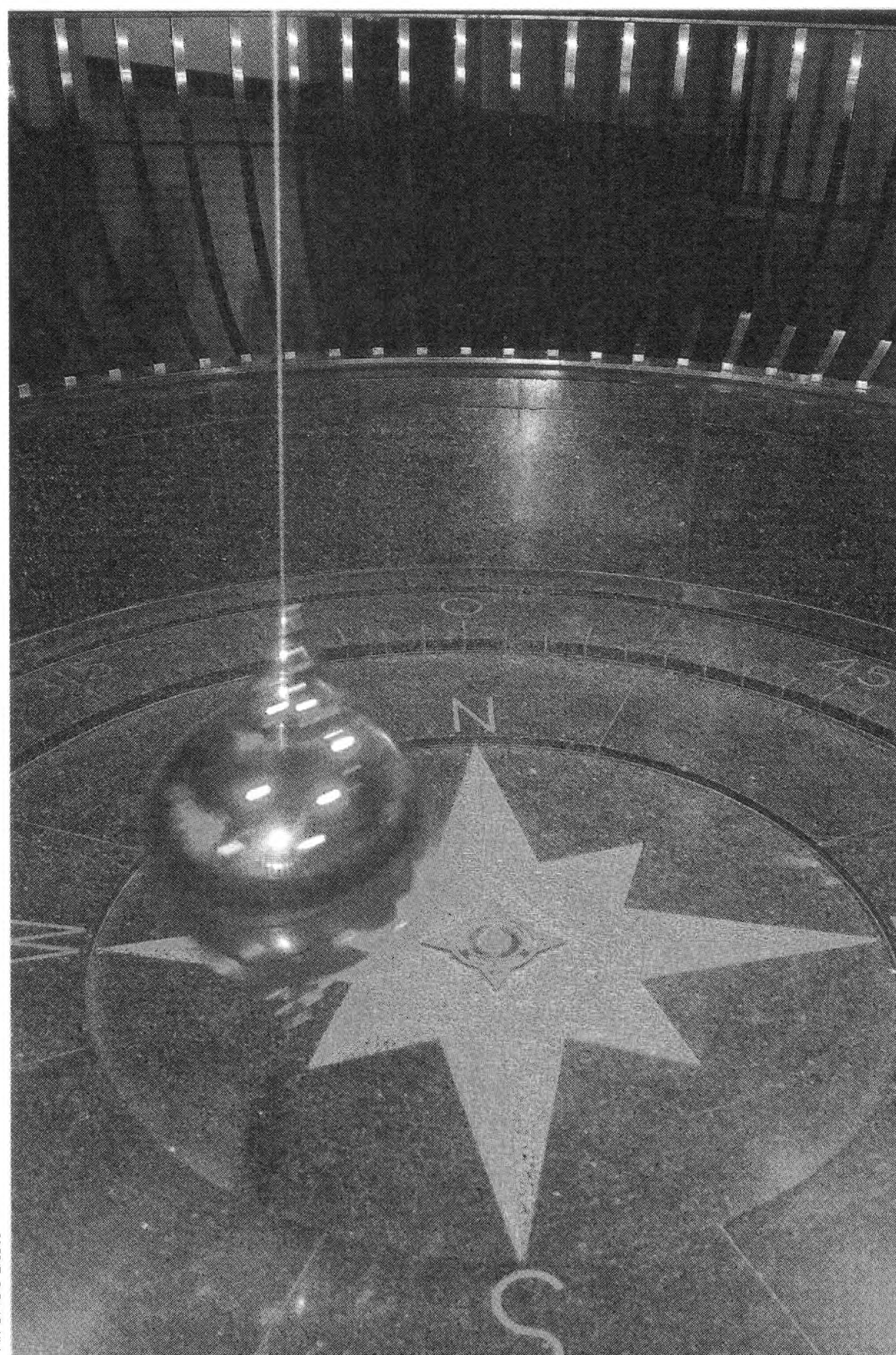
floor rotates under the pendulum, new pegs come into contact with the ball's constant swing. The time it takes for the pendulum to knock down a full circle of pegs is a function of its location on the Earth.

"Mathematicians can split the Earth's spin into two components," Vanstone explains.

"There is a lateral (sideways) motion and a rotational (twisting) motion. At the poles, all of the motion is rotational, so the floor takes 24 hours to spin 360 degrees under the pendulum. At the equator, all of the motion is lateral, so the floor never appears to rotate under the pendulum." In between these two zones, the Earth's motion is both lateral and rotational, so it takes longer for the pendulum to knock down a full circle of pegs — about 36 hours at San Francisco's latitude.

Around the world, curious observers can watch pendulums knock down pegs at a variety of different

speeds. The Academy's instrument shop has now manufactured over 90 pendulums of varying sizes for institutions as far away as the Kuwait Science Foundation. For a pendulum closer to home, swing by the Academy of Sciences — the newly polished ball is back in motion, captivating audiences of all ages once again.



CREDIT: DONG LIN

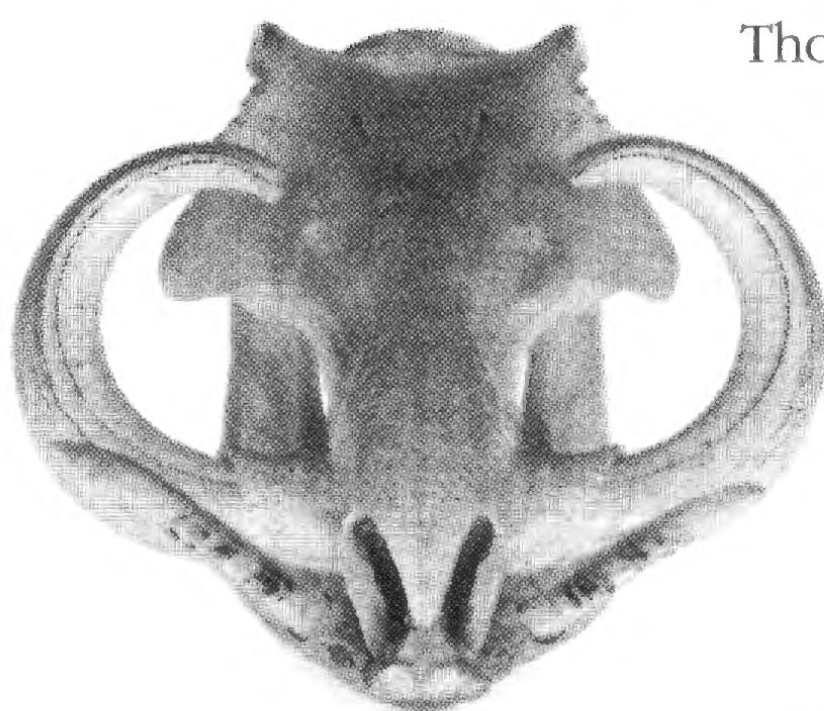
After a nine-month hiatus, the Academy's giant pendulum is back. As it swings, the hypnotic pendulum proves a physics fundamental: The earth rotates.

Everything is Open!

The repair and construction efforts following our fire last August are nearly finished and all Academy exhibit halls are open again. In addition to the exhibits listed below, come check out the Academy's earthquake theater, the new Academy store and our giant pendulum in the newly renovated Hohfeld Hall.

1500 Skulls

Through Late 2003



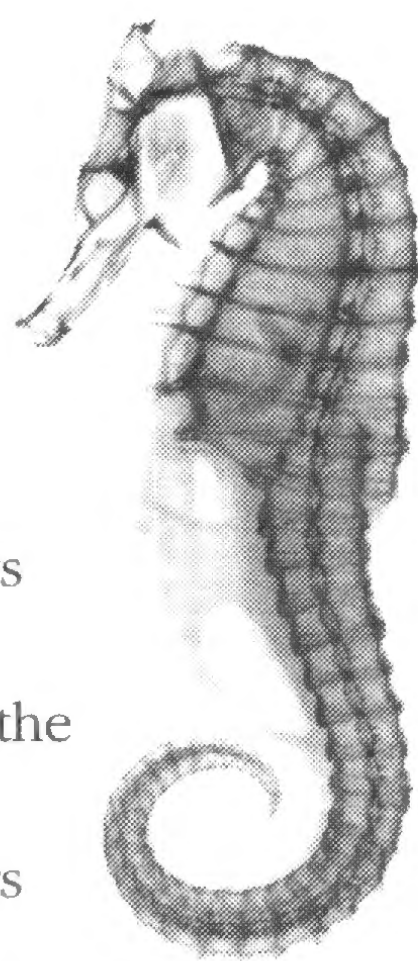
A warthog skull – *Phacochoerus africanus*.

Thousands of flesh-eating carrion beetles are busy feasting on dead heads. 860 sea lion skulls have been put into position for a display that runs the length of a professional basketball court. And one physical anthropologist is gazing 3.3 million years into the past at a single monkey. All this and more is on display in **skulls**, an exhibit featuring over 1,500 diverse dead heads, representing animals that range from ancient squirrels to modern mice, and from hawks to humans.

X-Ray Ichthyology

Ongoing

Are they works of art or part of a serious scientific study? Both. Prepare to look at fish in a whole new light. X-Ray Ichthyology captures 46 fish from the Academy's ichthyology collection on X-ray film. Academy scientists originally prepared these X-rays for scientific purposes but quickly saw their artistic value and wanted to share them with the public. Blown up and backlit, these large-format photographs transform scaly swimmers ranging from piranhas to guitarfish into eerie, luminescent works of art.



A sea horse – *Hippocampus aterrimus*. A work of art, a scientific specimen, or both? You decide in X-Ray Ichthyology.

Upcoming Members' Lectures & Events

Lines in the Water:

**Nature and Culture at Lake Titicaca
with Ben Orlove**

Wednesday, October 9 2 & 7:30 pm (F)

Neither God Nor Devil:

**Rethinking Our Perception of Wolves
with Eva Lena Rehnmark**

Wednesday, November 13 2 & 7:30 pm (F)

Photo Contest Winners

Through December 2002

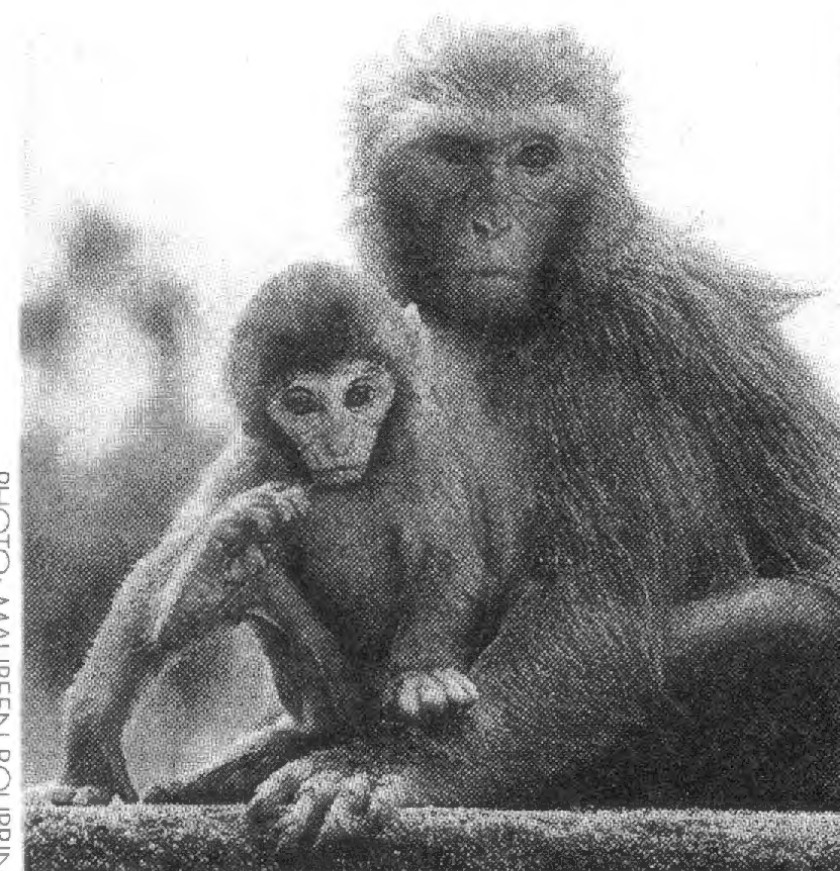


PHOTO: MAUREN BOURBIN

Four pairs of eyes painted upon the spire of Swayambhunath shrine in Nepal look down benevolently upon its earthly guardians, a boisterous tribe of rhesus monkeys, *Macaca mulatta*.

From France to Fresno, children ages 6 to 18 have submitted photographs to the Children's Photography Contest at the Academy. Now, come see the winning entries on display in Wild California Hall. Winning photos from a separate competition for Academy staff are also featured.

Powers of Ten

Through January 2003
Come visit a place where the farthest reaches of

the Universe and the familiar features of your own back yard are just a few steps - and a few zeros - apart. Powers of Ten, an exhibit based on the landmark film by Charles and Ray Eames, uses a series of photographs, videos and objects from the Academy's collections to explore 44 powers of ten, beginning with 10^{26} meters (the size of the known Universe) and ending at 10^{-18} meters (the size of the smallest known subatomic particles).

Fantasy of Gems

San Francisco Gem & Mineral Society's 48th Annual
Golden Gateway to Gems

Saturday, August 17, 10 am to 6 pm

Sunday, August 18, 10 am to 5 pm

Fort Mason's Herbst Pavilion

Dr. Jean DeMouthe, Senior Collections Manager at the California Academy of Sciences will be available on Sunday from 2-5 pm to identify gems and minerals, including jewelry.

Academy specimens will be on display. Academy members receive discounted admission. For more information, call (415) 564-4230. (D)

Stepping: The Body as Drum

An African-American Step Show

The drum is surely the instrument most closely associated with African musical expression. But in slaveholding areas in the New World, where playing drums was discouraged or even prohibited, Africans turned to other musical strategies. The body itself became their instrument: clapping, slapping the hands against various parts of the body, and stomping feet produced the complex rhythmic foundation for dancing—and became a sort of dance in its own right. Such “body music”—widely documented in West Africa—was not new, but it may have become more prevalent in the Americas in response to the ban on drumming.

Over time, African-American movement arts blended with other traditions to produce a wide range of dance styles, including

“stepping.” This dynamic art form features an array of bodily percussion, along with synchronized body movements, singing, chanting, and verbal play. Over its half-century history, stepping has incorporated elements of many other popular artistic forms, including military drills, children’s games, cheerleading, martial arts, acrobatics, hip-hop, and tap dance.

Begun in the mid-20th century by members of African-American fraternities and sororities, step teams have more recently become popular among children and teens. *The Bay Area Steppers will perform stepping and hip-hop on Saturday, September 28 at 1 pm in Morrison Auditorium.* (F)

—Dr. Jennifer Michael, Anthropology Department
jmichael@calacademy.org

A Journey to the Land of Faerie

The fairies of the Celtic lands are as tall as mortals, but much more beautiful and powerful. They dwell in the “other world” of Faerie, which exists alongside us, though invisible to us. Nancy Thym plays the harp and tells stories of this world. *Saturday, August 10, 1 pm; Morrison Auditorium* (F)

Cultural Traditions of the Silk Road

Ballet Afsaneh, one of the few performing arts companies to preserve and present the cultural traditions of Central Asia, presents two programs highlighting the dance, music, and poetry of this region.

Afghanistan and Uzbekistan – *Saturday, August 17, 1 pm; Morrison Auditorium* (F)

Persia – *Saturday, August 24, 1 pm; Morrison Auditorium* (F)

Body Music and Fancy Footwork

Throughout the month of September, the Traditional Arts Program presents a series of events exploring what might be called “body percussion”—making rhythmic music with the body, especially the feet.

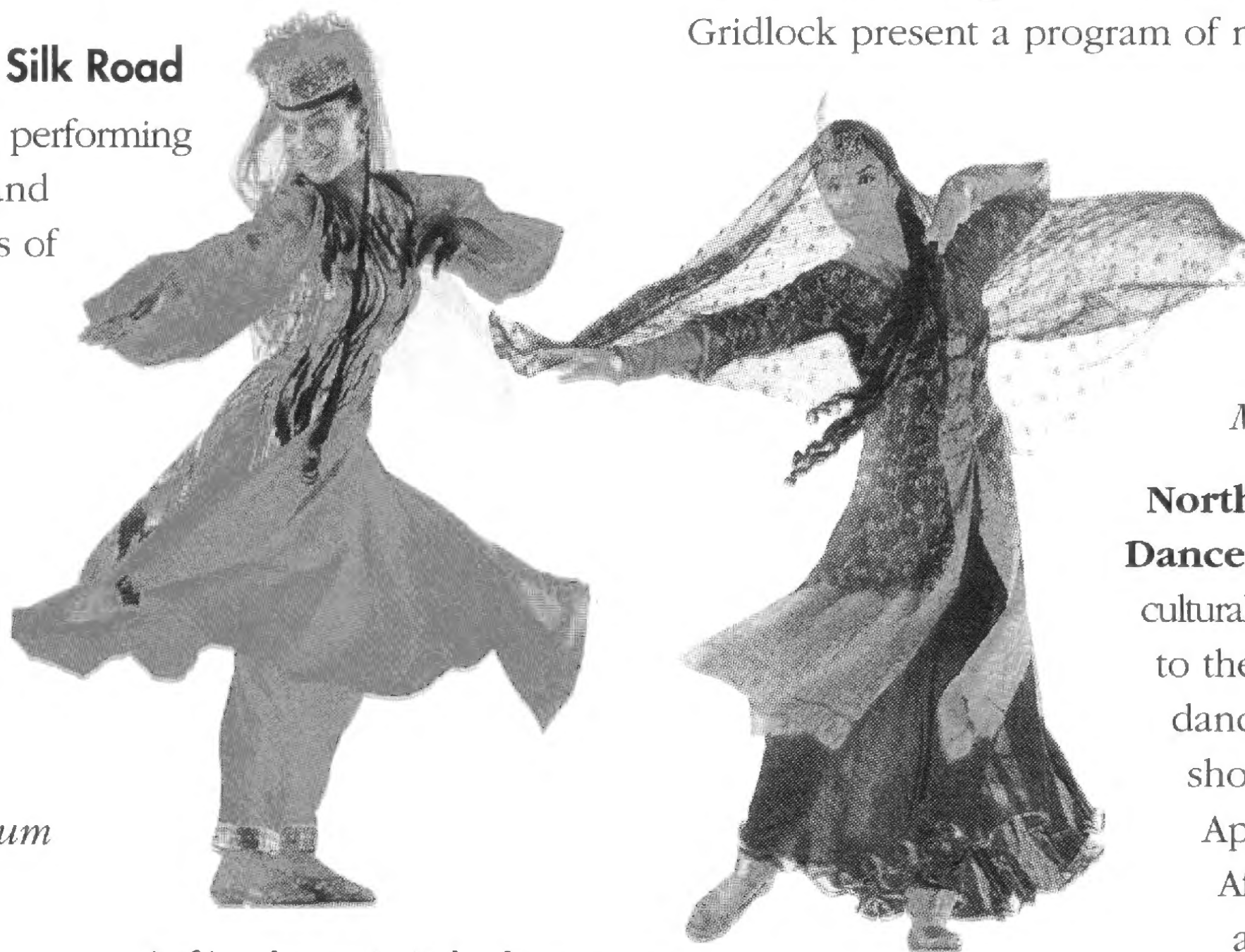
Zapateo Criollo: Afro-Peruvian Dance – Dance to the beat of the *cajón* (box drum), the *zapateo criollo*, with its intricate percussive footwork, is an Afro-Peruvian dance form found along the coast of Peru, where Africans were brought as

slaves beginning in the 16th century. This program features a performance by De Rompe Y Raja, a Peruvian folk dance ensemble, and includes the participation of choreographer Lalo Izquierdo. *This program is in honor of Hispanic Heritage Month. Saturday, September 7, 1 pm; Morrison Auditorium* (F)

Dances from English Tradition – The dancers of Swords of Gridlock present a program of noise-making English dances.

Clogging, the rapper sword dance, morris dancing (with bells), and other styles will be performed to live music. *Saturday, September 14, 1 pm; Morrison Auditorium* (F)

North American Percussive Dance – Evie Ladin discusses the cultural influences that have contributed to the various styles of percussive dance in North America. She will show us samples of English and Appalachian clogging, the African-American-based hambone, and other dance styles. *Saturday, September 21, 1 pm; Morrison Auditorium* (F)



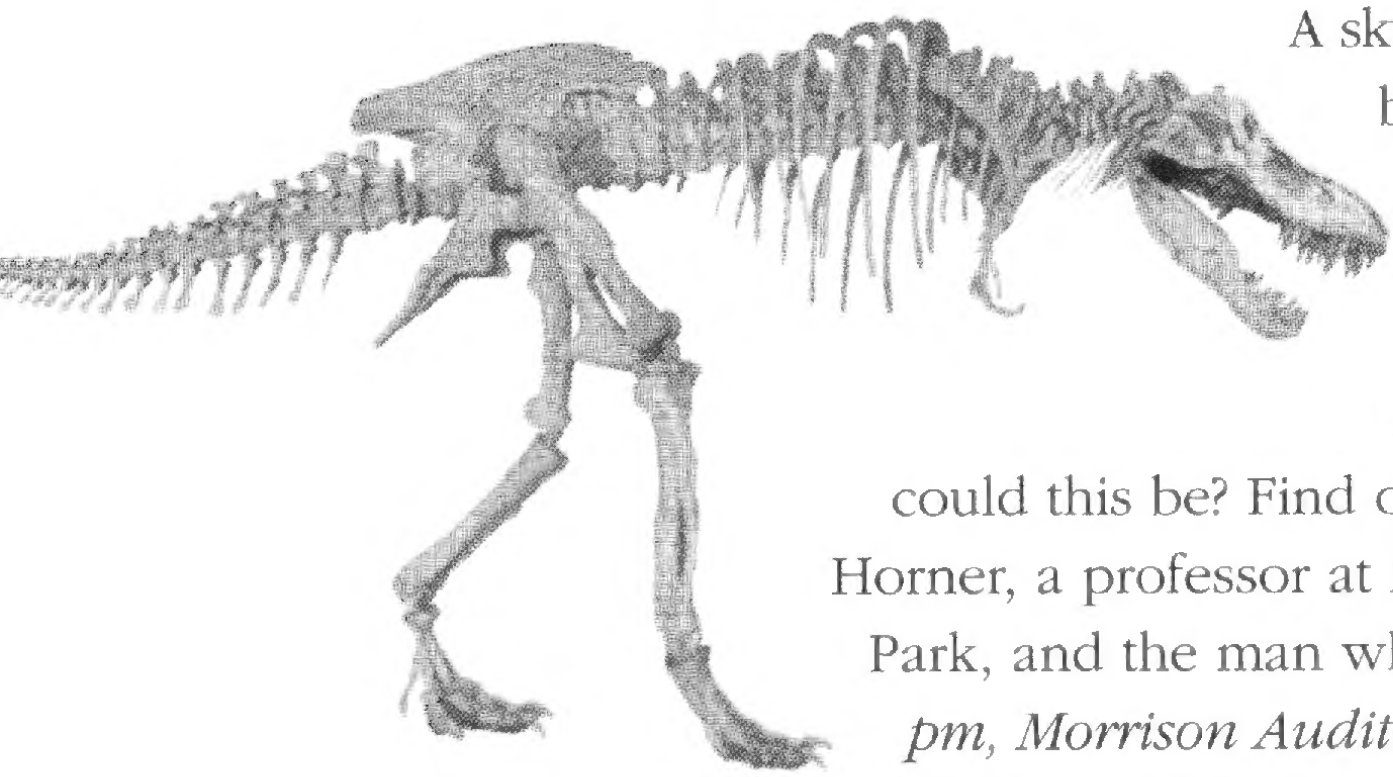
(Left) a dancer in Uzbek costume;
(right) a dancer in Persian costume.

i Presentations are free; no reservations are needed. For further information contact Dr. Jennifer Michael at (415) 750-7165, or visit www.calacademy.org.

The Traditional Arts Program is funded by the Paul L. and Phyllis Wattis Foundation.

T-rex on Trial: Predator or Scavenger?

Dr. Jack Horner on a Scientific Debate of Geologic Proportions



A skull with 1.2-meter jaws, raggedly studded with 18-centimeter teeth that could crush bone and consume 225 kilograms of flesh in a single bite. Clearly it belonged to the ultimate predator, the undisputed master of the Cretaceous world...or not. According to Dr. Jack Horner, one of the world's leading paleontologists, Tyrannosaurus rex was not a hunter at all. Evidence in the T-rex skull, hips and leg bones appear to tell a different story. T-rex may have been a scavenger. How

could this be? Find out and explore the T-rex scavenger theory with Dr. Jack Horner himself. Dr. Horner, a professor at Montana State University, was a technical adviser to Steven Spielberg's Jurassic Park, and the man who inspired the Sam Neil character in these films. *Saturday, September 21, 7:30 pm, Morrison Auditorium, \$6 members/\$8 non-members; Children's Lecture: T-Rex Skulls, Sunday, September 22 1 pm, Morrison Auditorium, Free.* (D) / (F)

T-rex: hunter or scavenger? Find out with Dr. Jack Horner, who was the inspiration for a character in Jurassic Park.

i To purchase tickets use the form on page 14 or call (415) 750-7128. Tickets may also be purchased at the door.

Empty-Headed Fun in Skulls

Rebuilding Australopithecus – See the facial reconstruction of our ancient ancestor the “Taung Child” and learn how modern forensic technology is used in skull reconstruction. *Friday, August 2 through Sunday, August 4; 10 am to 5 pm* (F)

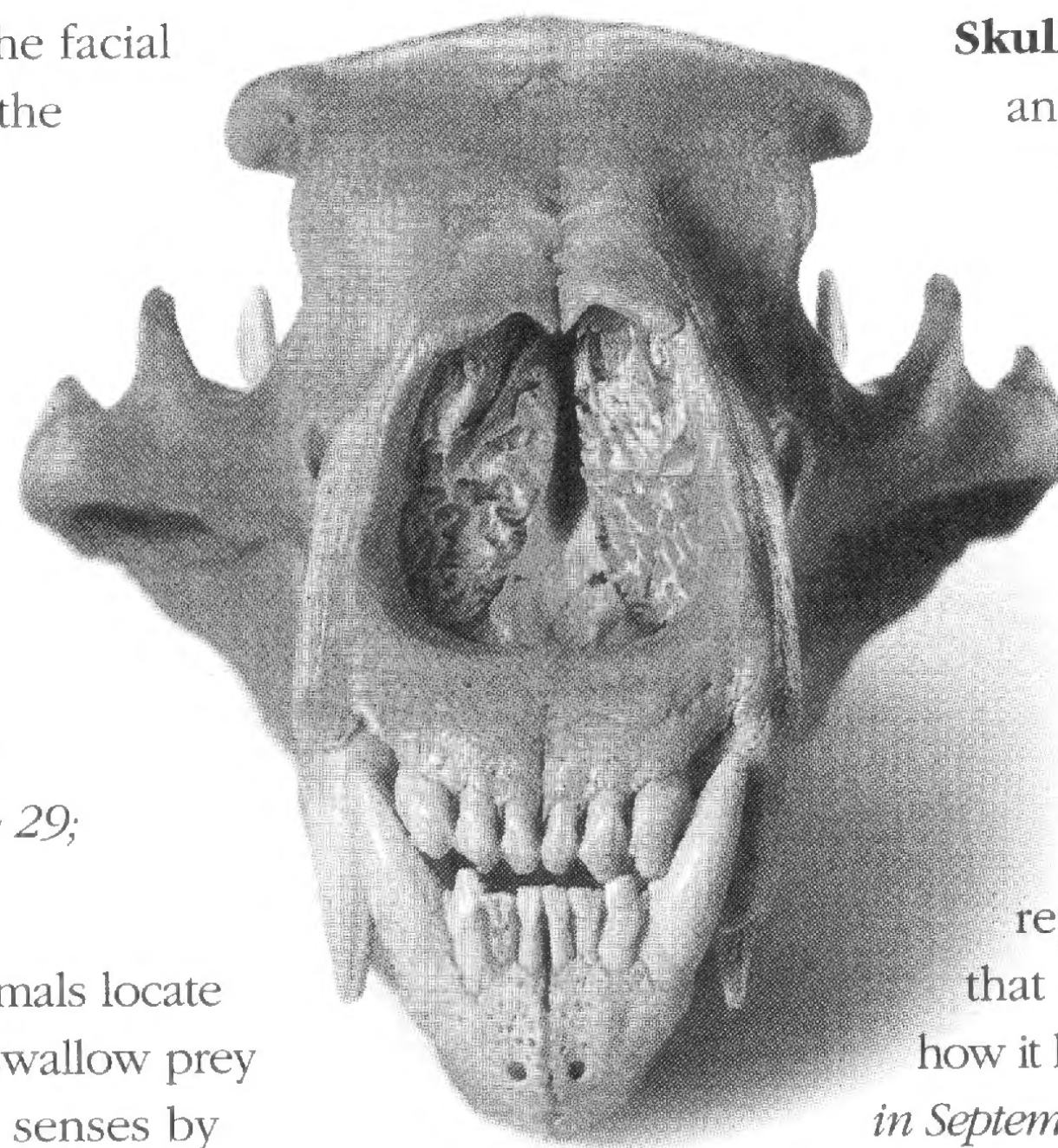
Make a Skull– Examine real skulls and then make a simple machine skull model of your own. *Monday, August 5, 12 & 26; Sunday, September 1; Saturday & Sunday, September 28 & 29; 12:30 pm to 3:30 pm* (F)

How Do They Do That? – How do animals locate prey without seeing it or hearing it? Or swallow prey bigger than their heads? Explore animal senses by looking at skulls. *Tuesdays in August; Tuesday, September 10, 17, 24; 11:30 am and 1:30 pm* (F)

Mysterious Victims of Flying Predators – Examine the hunting technique of hawks, eagles and other flying predators, then help us reconstruct the scene of the crime as we identify the skulls of their prey. *Wednesdays in August; Thursdays in September; 11:30 am and 1:30 pm* (F)

Bare Bones – Take a crash course on recognizing animals by their skulls alone. Examine human, hyena, turtle and rodent skulls, learning important details used by experts to compare species. *Thursday, August 1, 8, 15, 29; 11:30 am and 1:30 pm*

Maene Mammal Skulls – Join a fun, family mini-lecture that explains different aspects of the anatomy and function of marine mammal skulls. *Friday, August 9 & 16; 11:30 am and 1:30 pm* (F)



Skulls Culture – Explore some of the beliefs and practices associated with skulls around the world, including the head-shrinking of Jivaro Indians. *Saturday, August 10, 17, 24, 31; Sunday, September 8, 15; 11:30 am and 1:30 pm* (F)

Bird Skulls – Meet a live toucan, touch real bird skulls and explore avian skull design. *Sunday, August 11, 25; Saturday, September 7, 14; 11:30 am and 1:30 pm* (F)

Skull Detective – Examine mammal, bird, reptile and fish skulls as we look for clues that may reveal what the skull owner ate and how it lived. *Friday, August 23 and 30; Wednesdays in September; 11:30 am and 1:30 pm* (F)

i All programs are free and take place in the skulls exhibit. For more information call (415) 750-7143.

Story Time

Story Time takes place at 10:30 am each Saturday in the Skulls Exhibit. Themes for the months of August and September are:

August – Herpy Tails: Stories of Frogs, Turtles, Lizards, and Snakes (F)

September – Insect Investigation: Explore the world of Insects and Spiders (F)

August 2002 at the Academy

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4 FP Rebuilding Astralopithecus 10am–5pm p7	5 FP Make a Skull 12:30 & 3:30pm p7	6 FP How Do They Do That? 11:30am & 1:30pm p7	7 FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	8 FP Bare Bones 11:30am & 1:30pm p7	9 FP Marine Mammal Skulls 11:30am & 1:30pm p7	10 FP Skulls Culture 11:30am & 1:30pm p7 FC Bats 6:30–9:30pm p10 FP The Land of the Faerie 1pm p6
11 FP Bird Skulls 11:30am & 1:30pm p7	12 FP Make a Skull 12:30 & 3:30pm p7	13 FP How Do They Do That? 11:30am & 1:30pm p7	14 FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7 L Dr. Richard Tenaza 2 & 7:30pm p3	15 FP Bare Bones 11:30am & 1:30pm p7	16 FP Marine Mammal Skulls 11:30am & 1:30pm p7	17 FP Story Time 10:30am FP Skulls Culture 11:30am & 1:30pm p7 FP Silk Road: Afghanistan & Uzbekistan 1pm p6
18 FP Bird Skulls 11:30am & 1:30pm p7	19 FP Make a Skull 12:30 & 3:30pm p7	20 FP How Do They Do That? 11:30am & 1:30pm p7	21 FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	22 L What Just Happened? Dr. James Glieck 7:30pm p3	23 FP Skull Detective 11:30am & 1:30pm p7	24 FP Skulls Culture 11:30am & 1:30pm p7 FP Silk Road: 1pm p6 FC Tennessee Valley 6:30–9:30pm p10
25 FP Make a Skull 12:30 & 3:30pm p7	26 FP Make a Skull 12:30 & 3:30pm p7	27 FP How Do They Do That? 11:30am & 1:30pm p7	28 FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	29 FP Bare Bones 11:30am & 1:30pm p7	30 FP Skull Detective 11:30am & 1:30pm p7	31 FP Story Time 10:30am AC Pescadero Marsh 8:30–1:30am p10 FP Skulls Culture 11:30am & 1:30pm p7

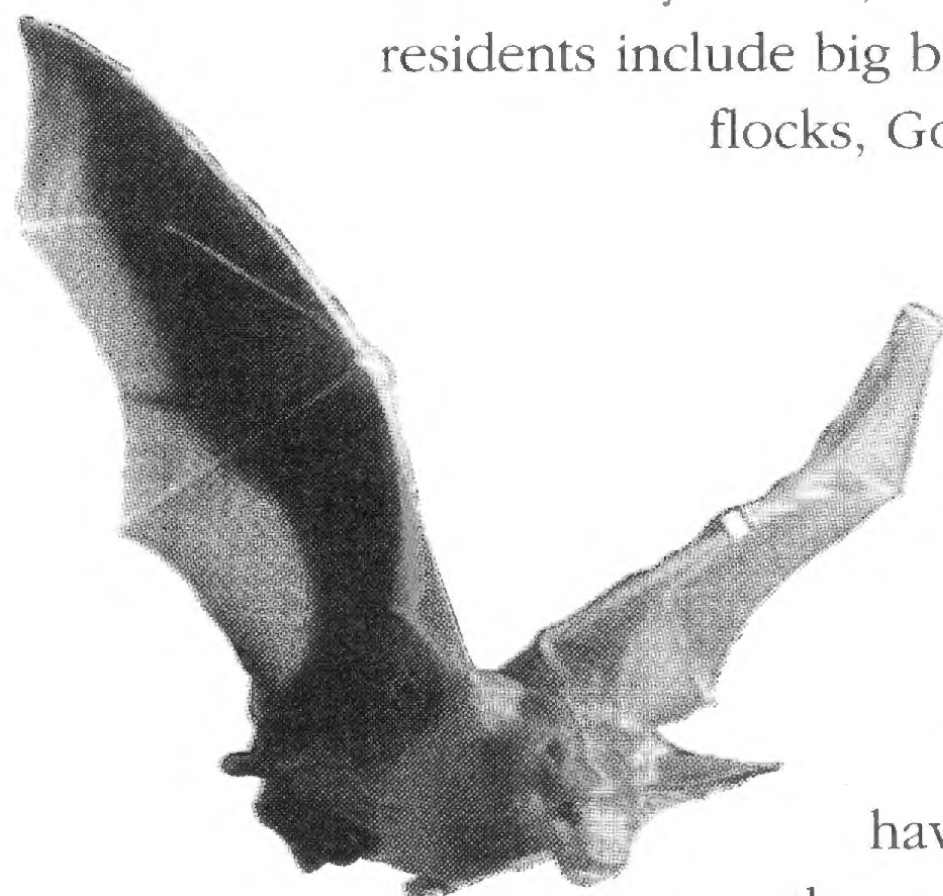
September 2002 at the Academy

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 ●FP Make a Skull 12:30 & 3:30pm p7	2	3	4 ●FP Skull Detective 11:30am & 1:30pm p7	5 ●L Dr. Timothy Ferris 2 & 7:30 pm p11 ●FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	6	7 ●FP Afro-Peruvian Dance 1pm p6 ●FP Bird Skulls 11:30am & 1:30pm p7 ●FC Summer Night Sky 6:30pm–9:30pm p10
8 ●AC Birds of Limontour Beach 9am–4pm p10 ●FP Skulls Culture 11:30am & 1:30pm p7	9 <i>1850 – The State of California is admitted to the Union.</i>	10 ●FP How Do They Do That? 11:30am & 1:30pm p7	11 ●FP Skull Detective 11:30am & 1:30pm p7	12 ●FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	13 ●PE Morrison Planetarium Premier “Stars Over San Francisco: Then and Now” 2pm p11	14 ●FP Story Time 10:30am ●FP Bird Skulls 11:30am & 1:30pm p7 ●FP English Dances 1pm p6
15 ●FP Skulls Culture 11:30am & 1:30pm p7	16	17 ●FP How Do They Do That? 11:30am & 1:30pm p7	18 ●FP Skull Detective p7	19 ●FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	20	21 ●AC Chain Lakes of GG Park 8am–noon p10 ●FP North American Percussive Dance 1pm p6 ●L T-rex on Trial 7:30pm p7
22 ●L T-rex on Trial: Family Lecture 1pm p7 <i>1916 – North American Hall is dedicated.</i>	23	24 ●FP How Do They Do That? 11:30am & 1:30pm p7 <i>1905 – The schooner “Academy” reaches Galápagos.</i>	25 ●FP Skull Detective 11:30am & 1:30pm p7	26 ●FP Mysterious Victims of Flying Predators 11:30am & 1:30pm p7	27	28 ●FP Story Time 10:30am ●FP Bay Area Steppers 1pm p6 ●FP Make a Skull 12:30 & 3:30pm p7
29 ●FP Make a Skull 12:30 & 3:30pm p7 <i>1923 – Steinhart Aquarium opens.</i>	30					

●L = Lecture (415) 750-7096
●PE = Planetarium Event (415) 750-7127
●FP = Free Family Program (415) 750-7145
●FC = Family Class (415) 750-7100
●AC = Adult Class (415) 750-7100

The California Academy of Sciences is open 365 days of the year.

Going Batty in Golden Gate Park



Bats are a worldly bunch, making their homes in a variety of habitats, including right here in San Francisco. Year-round residents include big brown, Mexican free-tailed, Yuma, and California myotis bats. Known more for its feathered flocks, Golden Gate Park hosts all these skin-winged species, too. In fact, according to bat expert

Dr. Dave Johnston, Stow Lake is one of the city's best places to observe big brown and Mexican free-tailed bats in action, swooping for insects.

A wildlife ecologist at H.T. Harvey & Associates and adjunct professor at Santa Clara University, Dr. Johnston has studied California bats since 1992 when he began his Ph.D. thesis work at York University. Despite their ubiquity, bats were among the least understood of all mammals.

"I felt bats represented one of the last frontiers of exploration in vertebrate zoology," Dr. Johnston said. "There is an incredible diversity in bats. Microchiroptera (small bats) have been catching insects in the air in the dark for over 60 million years. That suggests that there are plenty of elaborate and highly evolved systems out there with stories yet to be discovered."

Dr. Johnston's efforts to decipher the tales of these hard-to-study, mostly nocturnal animals have taken him to sites in Mexico, Belize, and throughout California. He has also sought to dispel the myths surrounding them. Understanding bats, as with other misunderstood creatures, is just the first step in conserving them.

On August 10, Dr. Johnston will lead "Secret World of Bats," a family seminar and mini field trip into Golden Gate Park. The course offers an opportunity to discover just how amazing and unscary bats really are by seeing them up-close and learning about their natural history and biology, including how they locate prey in the dark.

Seminar and Field Trip for Families with Children Ages 6 and up - Saturday, August 10, 6:30-9:30 pm \$25 adults/\$20 children, members; \$30 adults/\$25 children, non-members **D**

Tennessee Valley at Dusk

Hone your nighttime observational skills in southern Marin County by searching for bats, trying to communicate with great horned owls, and looking for bobcats out mousing. For families with children ages 8 and up. Instructed by environmental educator Chris Giorni. *Family Field Trip - Saturday, August 24, 6:30-9:30 pm \$20 adults/\$15 children, members; \$25 adults/\$20 children, non-members* **D**

Pescadero Marsh

The relatively undisturbed San Mateo County lagoon's ocean waters, rocky coast, sand dunes, freshwater marsh, and mud flats provide a rich, diverse habitat for a wealth of birds, including black oystercatchers, wandering tattlers, northern shovelers, and black turnstones. Instructed by birder Dan Murphy. *Adult Field Trip - Saturday, August 31, 8:30-11:30 am \$30 members/\$35 non-members* **D**

The Late Summer Night Sky at Hume Observatory

Hunt for star clusters in the Milky Way, and view the conjunction of Venus and Jupiter in the west after sunset at the Academy's Pepperwood Nature Preserve in Sonoma County. Instructed by astrophysicist Darryl Stanford. *Adult Overnight Field Trip - Saturday-Sunday, September 7-8, 6:30 pm Saturday to 9 am Sunday (RAIN DATE: September 28-29) \$55 members/\$60 non-members* **D**

Birds of Limantour Beach

Explore the tidal flats, marshes, and riparian habitats of the Point Reyes National Seashore, where great horned owls, adult male summer tanagers, white-tailed kites, and purple martins have been spotted. Instructed by naturalist David Wimpfheimer. *Adult Field Trip - Sunday, September 8, 9 am-4 pm \$40 members/\$45 non-members* **D**

Chain of Lakes and Western Golden Gate Park

In what has long been known as one of San Francisco's best fall birding spots, early blooming eucalyptus and other abundant food sources attract migrating flycatchers, vireos, warblers, sparrows, and finches. Instructed by birder Dan Murphy. *Adult Field Trip - Saturday, September 21, 8 am-noon \$30 members/\$35 non-members* **D**

Fall/Winter 2002/2003 Course Catalog

The latest catalog—with a complete list of field trips, seminars and workshops—should be arriving in the mail soon. Look for plenty of returning favorites, as well as an array of new offerings, in each subject. From adult field trips to winter-holiday Junior Academy classes, there are courses for all ages and interests.

i To sign up for classes call (415) 750-7100 or download a complete catalog and order form at www.calacademy.org/education.

The Academy's Morrison Planetarium turns 50!



The Academy's star projector, built and designed by Academy Staff has stood the test of time. In the past fifty years, only one part has been replaced.

Light takes 50 years to travel from the star Delta Aquilae in the constellation Aquila the Eagle to our eyes. In other words, when we look at Delta Aquilae in 2002, we're seeing light that left the star in 1952—when the Morrison Planetarium first opened its

doors to the public (on November 8, to be precise).

For half a century, Academy visitors have traveled to the Moon, to the planets, and to galaxies beyond imagining in our "Theater of the Stars." The Academy Star Projector, designed and built entirely by Academy staff and volunteers, was the first major American-made instrument of its kind, and even today is revered as a classic.

Sky Shows

Morrison Planetarium's feature Sky Show in honor of our fiftieth anniversary, "Stars over San Francisco - Then and Now," premieres Friday, September 13, at 2pm. It shows how the Planetarium and our knowledge of the Universe itself have changed since we opened our doors on November 8, 1952. *Show runs through March 2003. Schedule for September 13-30 is Weekdays: 2pm, Weekends: 2 & 3 pm.*

Planetarium shows run throughout the afternoon every day in August. In September, shows run throughout the afternoon during weekends and holidays only. During weekdays in September there is one afternoon show. The planetarium is closed September 9-12.

i **Members may exchange their planetarium vouchers for free tickets to Sky Shows at the Planetarium box office, starting 30 minutes before each show. Additional tickets may be purchased at the box office for \$2.50 for adults & \$1.25 for children 6-17 and senior citizens over 65. Cash only. All shows are approximately 40 minutes in length. For more information call (415) 750-7141 or visit www.calacademy.org/planetarium. Schedules subject to change.**

Seeing in the Dark

Timothy Ferris



Astronomy for the people: casual stargazing gains momentum as more amateur astronomers strike out with star charts, clear nights, and collaborate with scientific researchers.

Award winning science writer, Timothy Ferris, brings his experiences as an amateur astronomer to Morrison Planetarium, as he speaks about his latest work, *Seeing in the Dark*.

With more space probing power than the legendary observatories had a generation ago, amateurs can engage in serious scientific research, even collaborating with professional astronomers on cutting-edge projects. Ferris takes us inside this revolution that is sweeping astronomy and shows how anyone can get started in it, just

by going outside on a dark night with a star chart and learning his or her way around.

Dr. Timothy Ferris is emeritus professor at the University of California, Berkeley and the author of twelve books.

Thursday, September 5, 7:30 pm Morrison Planetarium; tickets \$3.

Dean Lectures

The Substellar Zoo

Dr. Gibor Basri

At an epochal session in a meeting in Florence in 1995, the astronomical community received its first confirmation that Nature makes objects that are smaller than stars and are now classified as both brown dwarfs (a very small or "failed" star) and extra-solar giant planets (huge planets outside of our own Solar System).

Dr. Gibor Basri, of the University of California Berkeley and a Fellow of the Academy, will summarize important discoveries in the substellar domain, and describe the issues of this debate. *Tuesday, September 17—Dr. Gibor Basri 7:30-9 pm; tickets \$3.*

i **Tickets may be purchased using the form on page 14, by calling the Planetarium Office at 415-750-7127 during business hours or purchased at the door.**

A Fond Farewell

Phyllis Wattis (1905-2002)

by Dr. Christiaan Klieger



PHOTO: SUSAN MIDDLETON (N37810)

Mrs. Wattis and Frank Talbot (Academy Director, 1982-88) in 1984.

The Academy and the city of San Francisco lost one of its most beloved friends and patrons of the arts on June 5. Phyllis Wattis, a pillar of support for our institution, passed away at age 97. Born in Salt Lake City, she was a great grand daughter of Brigham Young. Enthusiastic in her support of the Academy and deeply interested in its programs and their effect, Phyllis Wattis was active in the affairs of our institution for over 40 years. She served on our Board of Trustees from 1973-1988, and then became an Honorary Trustee until her passing. Many members of her large family remain closely associated with the Academy.

Her generosity was legendary. Among her gifts to the Academy was the Wattis Hall of Man (begun in 1973 and now the Wattis Hall of Human Cultures), and the establishment of an endowment for the Anthropology Department's Traditional Arts Program and the Wattis Symposium. "Phyllis Wattis contributed her passionate

commitment to public education and her own fascination with the natural world and human cultures," said Dr. Nina Jablonski, curator and Irvine Chair of Anthropology. "For us in the Anthropology Department, we owe so much of our current 'activity profile' to Mrs. Wattis."

Recently, Mrs. Wattis had shown a deep interest in plans for the construction of the new Academy facilities in Golden Gate Park. She always participated in the most humble manner, never wishing to attract attention to herself. The California Academy of Sciences expresses its deep condolences to her family, and will greatly miss her warmth and smiles. Her memory will live on in the scores of programs, exhibitions, and buildings she has given over the years, which help to educate and entertain millions of children and adults here at the Academy.



PHOTO: LLOYD ULLBERG (N3768F)

Phyllis Wattis with her son, Paul, pitching in at the groundbreaking ceremonies for Wattis Hall in 1974.

In Research...

A Whale of a Love Song



Dr. Alejandro Acevedo and his team recently published their findings about whales in the journal *Nature*.

The largest living animals on Earth, blue whales and fin whales produce the loudest sounds in the sea. According to new research conducted by Academy scientist Dr. Alejandro Acevedo and several of his colleagues, these deep, resonating pulses are actually long-distance love songs, sung by the males to attract females of the same species.

These findings, published in a recent issue of *Nature*, were the fruit of two seasons of fieldwork in Mexico's Loreto

Bay, where Acevedo and his team traced whale songs to their sources by towing a long line of underwater microphones through the Bay. Each microphone would pick up a whale's vocalization at a slightly different time and intensity, allowing

the scientists to determine the animal's position. Once they tracked down a singer, they collected snippets of skin and blubber with a small dart gun and compared the nucleotide sequences in the samples to determine the whale's gender. Without exception, all of the singing whales they tested were males, suggesting that the distinctive songs are part of a breeding display.

"Unlike humpback whales, blue whales and fin whales don't mate in established breeding sites," says Acevedo, senior aquatic educator and research associate at the Academy, "so they need some other way to find each other." It now appears that to do so, the males send out low-frequency serenades that can carry for miles underwater.

Unfortunately, these songs are getting harder to hear. Manmade noise from commercial ships, military sonar, and seismic surveys is increasing steadily, threatening to drown out the whales' calls. Populations of both blue whales and their slightly smaller relatives, fin whales, still suffer from past exploitation — the recovery of these species could be impeded if noise pollution interferes with their mating behaviors.

Volunteer Profile

Volunteer Returns with New Exhibit

Eames Demetrios, grandson of designers Charles and Ray Eames, grew up at the Academy. Today this former Academy volunteer has returned as the designer and architect of the new exhibit, Powers of Ten. As an eight-year-old in the early 1970's, Eames attended Junior Academy classes housed in the herpetology department and was a frequent visitor to the museum floor. He still remembers the 23 differences between reptiles and amphibians, and the words to "It's a long way from amphioxus" to the tune of "It's a long way to Tipperary."

At twelve, Eames was an active volunteer. He swabbed out swamp cages, learned about cold-water marine fish, and catalogued specimens, continually adding to his repertoire of responsibilities. When ABC-TV affiliate producers asked the Academy for a junior biologist to participate in a documentary about a 30-foot whale shark in the South Pacific, Eames was their candidate. For over a week he swam with the animal and rode on its back, having what he now describes as a "pretty incredible" experience.

Even then Eames appreciated that he was "totally doing the coolest thing" by spending his summers at the Academy.

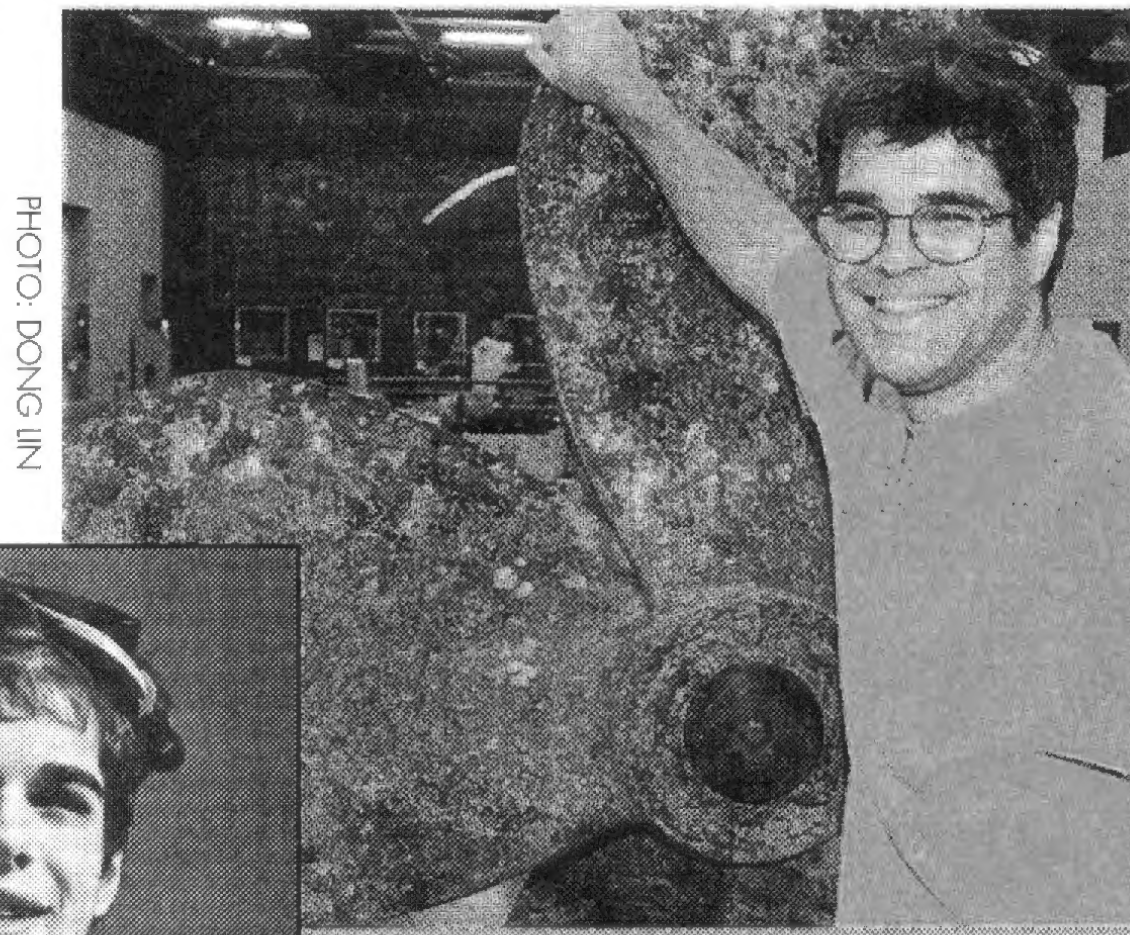
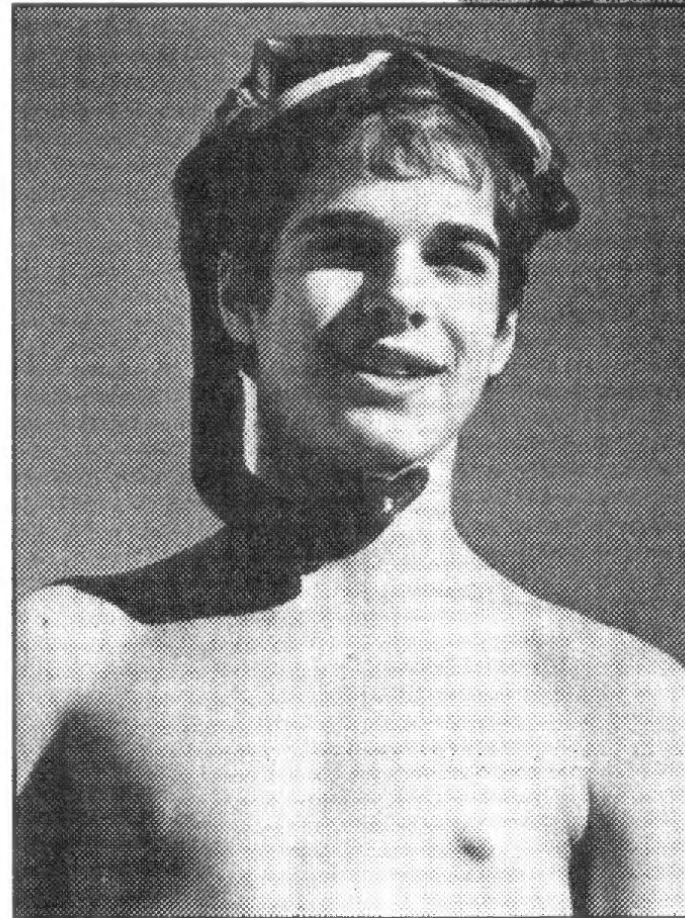


PHOTO: DONG LIN



(left) Eames Demetrios, grandson of Ray and Charles Eames – and junior biologist at the Academy. (above) Eames Demetrios back at the Academy to install Powers of Ten.

Having had the opportunity to work alongside Academy curators and scientists, it is no surprise that he has returned to the academy at the helm of a major new exhibit.

In preparing for **Powers of Ten**, Eames interviewed many of the same people he worked with when he was a teenager, giving this exhibit a very personal tone.

Volunteers are needed for Powers of Ten. The exhibit will be on

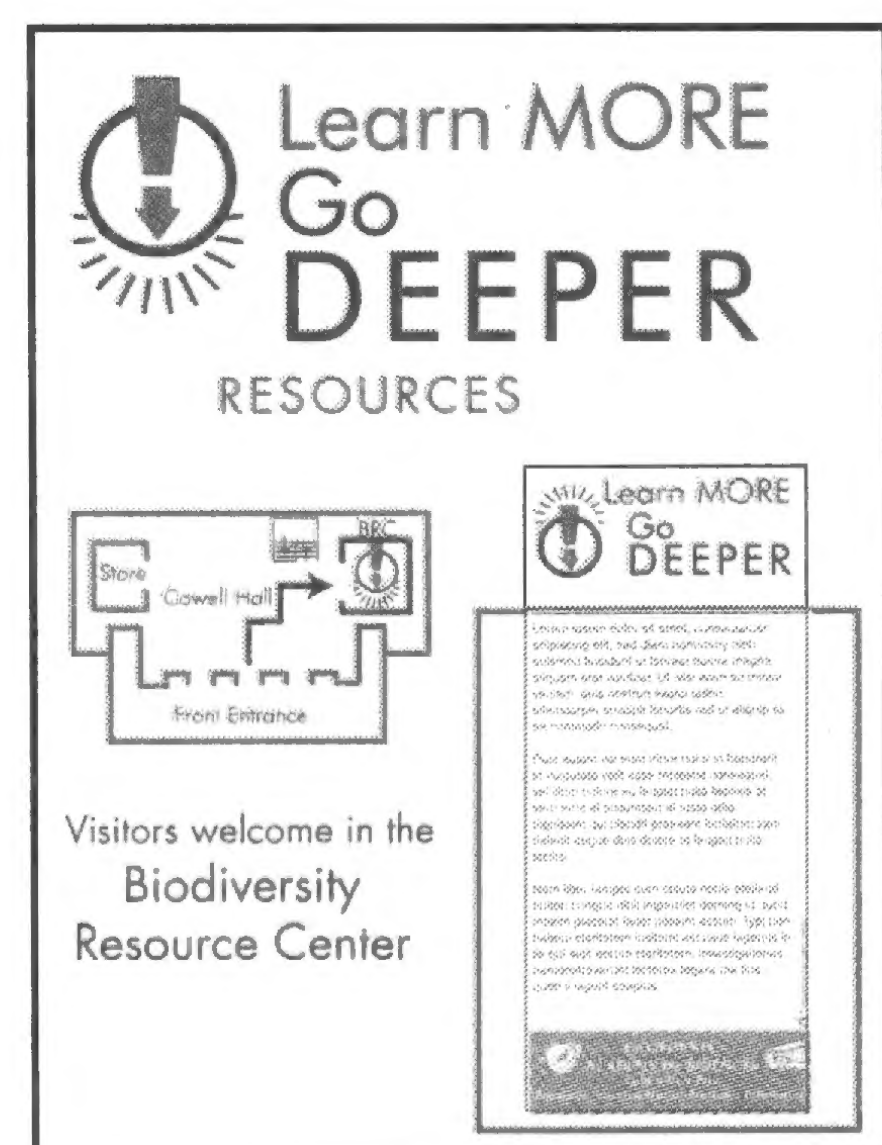
display until January 2003. Be a part of this unique experience and you too may be inspired to become the designer of a future Academy exhibit. Call (415) 750-7154.

The readers of *San Francisco Weekly* voted the Academy as the best museum in San Francisco. Our thanks go out to all who have bestowed this honor on us. For more, visit www.sfwweekly.com.

Check it out!

**Learn MORE
Go
DEEPER**

Discover more about Academy animals and exhibits. These new cards are available throughout the museum and will direct you to books, videos, web sites and Academy classes.



2003 Travel Calendar

Among the Great Whales: Baja California & the Sea of Cortez

Aboard the *Sea Bird*
January 11 – 19, 2003
Tour Leader: Peter Roopnarine

Exploring Vietnam and Cambodia

February 22 – March 9, 2003
Optional Extension to Laos
March 8 – 13, 2003
Tour Leaders: John and Pam McCosker

Cuba

February 22 – March 5, 2003
Tour Leaders: Frank and Mary Beth Almeda

Sailing the Caribbean

Aboard the *Sea Cloud*
March 28 – April 5, 2003
Tour Leaders: John and Pam McCosker

Costa Rica

March 2-14, 2003
Tour Leaders: Bob and Gail Drewes

The Rainforest, Reefs and Ruins of Honduras

April 5 – 13, 2003
Tour Leader: Tom Daniel

Amazon: The Greatest Voyage in Natural History

Aboard *La Esmeralda*
May 24 – June 1, 2003
Optional Extension to Machu Picchu
June 1 – June 6, 2003

Guizhou and Yunnan, China

June 6-21, 2003
Tour Leaders:
Nina Jablonski and George Chaplin

Russia & Alaska: From Russia's Kamchatka Peninsula to Alaska's Kenai Peninsula

Aboard the *Clipper Odyssey*
June 19 – July 3, 2003
Tour Leaders: Dave and Bev Kavanaugh

Exploring Alaska's Coastal Waterways

Aboard the *Sea Bird/Sea Lion*
July 12 – 19, 2003
Tour Leader: Bob Van Syoc

Trinidad and Venezuela

August 9 – 24, 2003
Tour Leaders: Frank and Mary Beth Almeda

Migration Safari to Kenya & Tanzania

October 10 – 23, 2003
Tour Leader: Wojciech Pulawski

Mysteries of Papua New Guinea & Melanesia

Aboard the *World Discoverer*
September 27 – October 14, 2003
Tour Leader: Terry Gosliner



Published by the California Academy of Sciences

Executive Director: Patrick Kociolek, Ph.D.

Publications Manager: Keith Howell

Editor: Eliot Dobris

Associate Editor: Bethany Morookian

Contributors: Nancy Baker, Anna Barr, Stephanie Greenman, Rosalind Henning, Deirdre Kernan, Christiaan Klieger, Jennifer Michael, Leslie Quillin, Tinka Ross, Juan-Carlos Solis, Kirsten Vanstone, Kevin Welch

Design & Production: Martha Murray Design

Editorial Office: Marketing & Communications
California Academy of Sciences
Golden Gate Park,
San Francisco, CA 94118
(415) 750-7395 info@calacademy.org

Birthdays at the Academy

Have your child or grandchild's next birthday party at the Academy—book early!

Members save 10%. Call (415) 750-7462 or visit www.calacademy.org for more information. ①

i For detailed itineraries and further information on these tours, contact the Academy Travel Office at 1-800-853-9372 or calacademy@hcaptravel.com.

ORDER FORM

LECTURES & EVENTS	QTY MEMBERS	QTY NON-MEMBERS	TOTAL
Searching for Ancient Monuments	FREE	\$8	=
Birds of East Africa	FREE	\$8	=
What Just Happened?	\$6	\$8	=
Powers of Ten	\$6	\$8	=
Seeing in the Dark	\$3	\$3	=
Dissecting Solar Systems	\$3	\$3	=

FIELD TRIPS, SEMINARS AND WORKSHOPS

To register for courses and other education offerings see page 10.

DONATIONS ☐ Yes, I would like to support the Academy with a donation. \$

TOTAL PAYMENT ENCLOSED \$ ☐ Check (made payable to CAS)

☐ Visa ☐ Mastercard ☐ American Express (\$10 minimum on credit card orders)

Card Number Exp. Date

I WOULD LIKE INFORMATION ON: ☐ receiving *Discovery*. ☐ giving a Gift Membership.
☐ making a gift from my will or living trust. ☐ giving from retirement plan proceeds.
☐ the benefits of life income plans. ☐ I have provided for the Academy in my will or other estate plan.
☐ becoming an Eastwood Associate

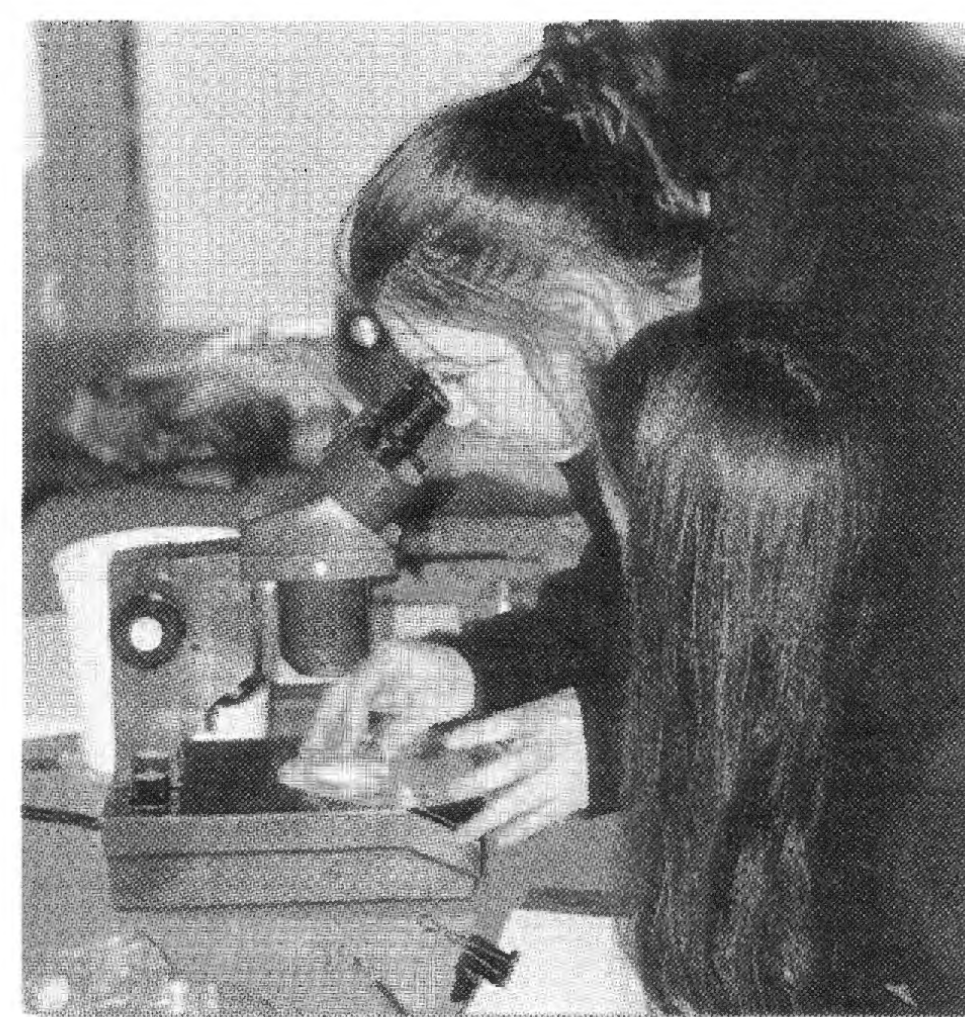
YOUR NAME: Phone
Address Member #
City State Zip

i Mail payment and order form to: Membership Office, Ticket Services, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118. **Include a self-addressed, stamped envelope for each series to which you subscribe. No refunds/exchanges. To order by phone call (415) 750-7128.**

Academy Receives Grants for Careers in Science

The Academy's Careers in Science program, which provides science training opportunities to local students, has received two generous grants. Careers in Sciences trains and employs interns to teach science to the museum's audiences, assist with scientific research, and provide administrative assistance to educational programs. The intern program serves approximately 30 students, ages 15 to 20, in a year-round program. Applicants are recruited via community partners and schools each spring. The Academy is pleased to acknowledge the receipt of \$34,000 from the Miranda Lux Foundation of San Francisco to support Careers in Science—the second year of a two-year grant to the Academy. In addition, the McGowan

Charitable Fund, a new member of the Academy's philanthropic community, has also generously donated \$20,000 to the program. The Academy wishes to thank these two organizations for their strong support of this vital educational program.

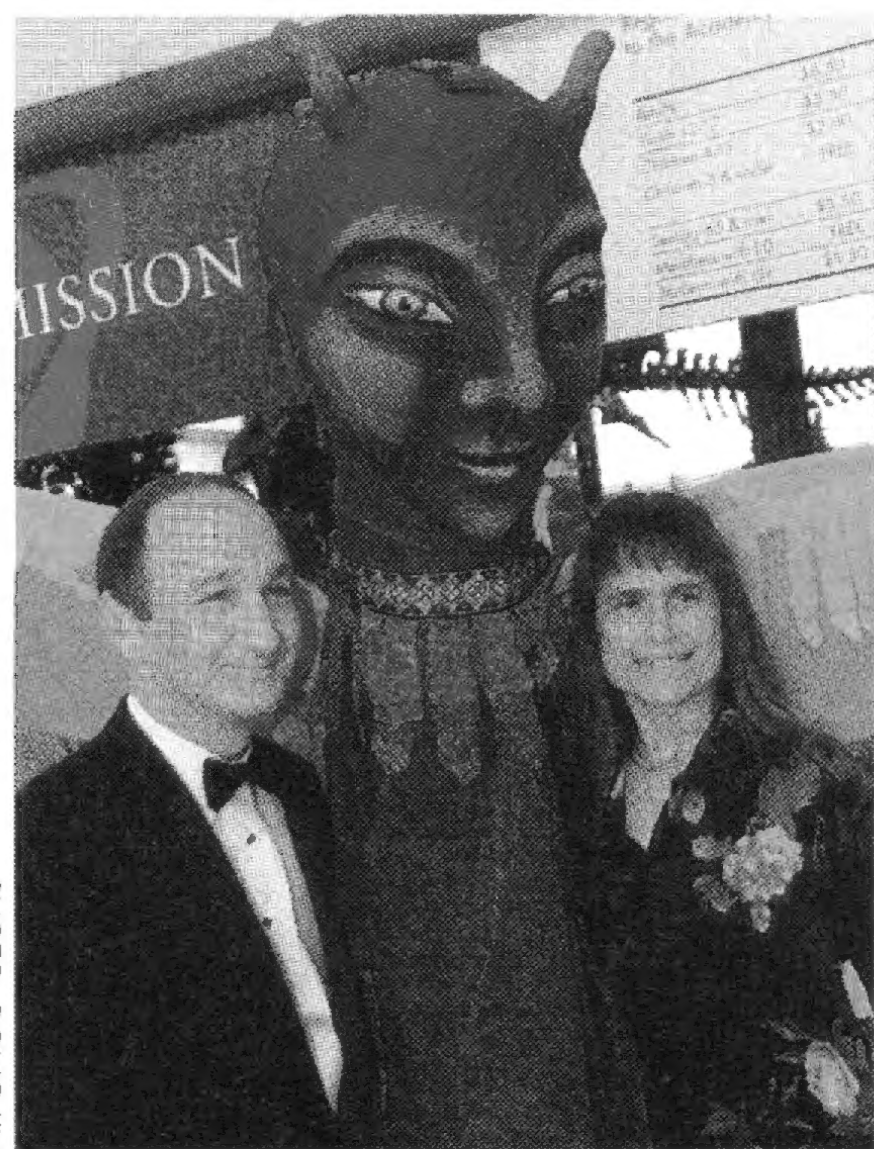


Academy interns hard at work.

Academy Ball 2002 A Success

One of the grandest events of the Academy year was held May 17. Sponsored by Dodge & Cox as lead corporate sponsor in addition to Franklin Templeton Investments, the "Earth-Ocean-Space Ball" welcomed hundreds of Academy supporters to an evening of dining, dancing, and entertainment. Christine H. Russell and Mark Schlesinger served as Dinner Committee Chairs, and Thomas Klein was Corporate Chair. The Academy is grateful for their participation, and also acknowledges the following for their contributions: Jeffrey Brodtkin, Crystal Geyser, Guenoc Winery, J Winery, Pepsi-Cola Company, See's Candy, Inc., Swan Oyster Depot,

and all others who generously contributed to the success of the event. The ball was sumptuously catered by Dan McCall. Included in the festivities were 23 groups of entertainers, ranging from the Brazilian Dance Ensemble to Captain Byrd and his parrots. Proceeds from the annual ball support research and education programs at the Academy.



Mark Schlesinger and Christine Russell, Academy Ball chairs.

New Donor Circle Members

March through April 2002: \$125 to \$999

Many thanks to the following new donors and those who have increased their support of the Academy in the last few months.

- | | |
|-------------------------------|------------------------------|
| Mr. & Mrs. Edward Adamson | Mr. Richard MacFarlane & |
| Mr. William Ahern | Mr. Robert Tschumper |
| Mr. & Mrs. Paul R. Andrews | Mr. & Mrs. Neil C. Marck |
| Mr. Peter J. Belton | Mr. & Mrs. Robert Martin |
| Mr. & Mrs. Kenneth G. Berry | Mr. & Mrs. Brian Maxwell |
| Mr. & Mrs. Robert G. Berry | Mr. Frank McGinnis |
| Mr. & Mrs. John S. Blum | Mr. & Mrs. Dave McLennon |
| Mr. Bob Fox & | Mr. & Mrs. Steve Miller |
| Mrs. Diana Brogoitti-Fox | Mr. Clayton Mitchell |
| Mr. David Andrew Brown | Mr. & Mrs. Peter Morris |
| Ms. Elizabeth S. Burnham | Ms. Mary Murphy |
| Ms. Jeanne Butler Morando | Mr. Joseph C. Neirinck |
| Mr. & Mrs. W. F. Cavier | Mr. & Mrs. Jeff Neish |
| Mr. Robert Cooter & | Mr. & Mrs. Kenneth A. Olsen |
| Ms. Blair Dean | Ms. Regina Phelps & |
| Mr. & Ms. Daniel Corcoran | Mr. Jim Hill |
| Mr. Charles S. Cronic | Mr. & Mrs. Gerald Przybylski |
| Mr. Richard P. Dolan | Mr. Walter P. Quintin |
| Dr. Barbara Drye & | Ms. Ursula E. Ralph |
| Dr. Charlie Goldberg | Mr. Weldon Rash |
| Mr. & Mrs. J. S. Edwards | Mr. & Mrs. William Rayburn |
| Mrs. Page Fenston | Mr. Doug Reed & Family |
| Ms. Aline Fountain | Mr. & Mrs. Neil D. Reid |
| Ms. Denise Garone & | Mr. & Mrs. Phillip S. |
| Mr. Stuart Kogod | Scarborough |
| Mr. & Mrs. Michael Gillfillan | Mr. & Mrs. Thomas Tegge |
| Ms. Christa Hertzka | Mr. & Mrs. Sloan Upton |
| Mr. & Mrs. Zachary Hulsey | Mr. John P. Waldum |
| Mr. & Mrs. George S. Ishiyama | Mr. & Mrs. Bill Watkins |
| Mr. & Mrs. Jack Kronfield | Mr. & Mrs. Richard Waugh |
| Ms. Ann Laurenson | Mr. & Mrs. Nelson S. Weller |
| Mr. & Mrs. Benjamin B. Law | Ms. Shelly Willard |
| Mr. & Mrs. Oren Lewin | Mr. & Mrs. Matthew Winter |
| Mr. Richard T. Lira & | Mr. & Mrs. David R. Wood |
| Ms. M. Gretchen Taylor | |

ACADEMY (ISSN 15312224) is published bimonthly by the California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118. Telephone (415) 750-7395, Fax (415) 750-7346. Periodicals Postage Paid San Francisco, California.

POSTMASTER: Send address changes to Academy, Membership Department, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118.

MEMBER INFORMATION

Guided Tours: Free one-hour highlight tours daily

Open 365 days a year.

Regular hours (Labor Day weekend to Memorial Day) 10 am – 5 pm

Summer hours (Memorial Day weekend to Labor Day) 9 am – 6 pm

Information Hotline: (415) 750-7145

Website: www.calacademy.org

email: info@calacademy.org

For information during the weekend: (415) 750-7375

Special Lectures: (415) 750-7128

Membership: (415) 750-7111

Library: (415) 750-7102

Education: (415) 750-7100

Call for Memories

Memories of Our First 150 Years



PHOTO: DONG LIN

A mother and child star gazing at the Academy. What's your favorite Academy story?

Proposing Under the Stars

There have been many moments at the Planetarium that will always make us smile when we think of them, including several marriage proposals. Most recently, the brother of a NASA astronaut asked us to help him propose to his girlfriend in private in the form of a PowerPoint presentation that we projected onto the dome. Playing it safe, this was after the end of the show and after the audience had left. Happily, she said "yes."

The Academy is turning 150 years old next year. We've been exploring and explaining the natural world to members like you since 1853. As we prepare to celebrate our anniversary we're asking our members to share their own stories about the Academy. Tell us:

- Did you fall in love while strolling these halls?
- Was your daughter inspired to pursue a science career?
- Did your baby learn to walk in African Hall?
- Or simply tell us why you like to visit.

Got a special photo from a visit? Send it in. We'll post selected stories and photos, in a special case on the museum floor and other locations.

As we approach our 150th birthday we reflect on both our past and our future. Each member is integral to the fabric of the Academy, so we want to hear from you.

To submit, include your name, address and phone number. Then send to:

150th Anniversary
California Academy of Sciences
Golden Gate Park
San Francisco, CA 94118

Or email: info@calacademy.org

To have your photo returned, include a self-addressed, stamped envelope.

CALIFORNIA ACADEMY OF SCIENCES

Golden Gate Park

Steinhart Aquarium

Natural History Museum

Morrison Planetarium

Education

Research

The Academy encourages the use of public transportation.